ASSIGNMENT 4

4-1. What is the first step in drawing a line through a given point, P, parallel to line XY?

1. Place compass needlepoint on P; strike an arc intersecting XY at any point
2. Place compass needlepoint on P; strike an arc intersecting the approximate midpoint of line XY
3. Place compass needlepoint on any point along line XY; strike an arc through point P and line XY
4. Place compass needlepoint on X; strike an arc through Y and near point P

4-2. To construct a perpendicular from a given point, P, on line XY, you should first place the compass needle at what point(s) ?

1. P
2. X or Y
3. A point near the midpoint of PX and PY
4. Any convenient point along XY

4-3. What points on a line should be used as centers for the intersecting arcs drawn to bisect the line?

1. The center and one end
2. A random point and one end
3. A random point and the center
4. The two ends

4-4. Line XY is to be divided into 12 equal parts by geometric construction. Which of the following statements concerning this procedure is correct?

1. Ray line PY, drawn from Y, is the same length as XY
2. A compass should be set to spread equal to one twelfth of the length of XY
3. A line should be drawn from X to the 12th interval on ray line PY
4. The acute angle formed by XY and ray line PY should be 30° or less

4-5. From what point should you carry out the first step of the procedure to bisect or transfer angle XYZ? (Always use the middle letter as the apex.)

1. A random point on XY
2. A random point on YZ
3. The apex Y
4. The midpoint of arc XZ

4-6. In which, if any, of the following constructions is it necessary to draw an angle by using a protractor?

1. Constructing an equilateral triangle on a given inscribed . circle
2. Constructing a right triangle for which the hypotenuse and one side are given
3. Constructing an equilateral triangle for which the length of one side is given
4. None of the above

4-7. Which of the following actions should be your first step in constructing a square geometrically when you are given only the length of its diagonal?

1. Lay out a horizontal line equal to one half of the given length
2. Lay out a vertical line equal to one half of the given length
3. Lay out a horizontal line equal to twice the given length
4. Lay out a horizontal line equal to the given length

4-8. In completing the drawing of a certain geometric figure, you have drawn the sides of the figure tangent to the points where two diameters (at right angles to each other) intersect a given circle. What geometric figure have you drawn?

1. A square in a given circumscribed circle
2. A square on a given inscribed circle
3. An equilateral triangle in a given circumscribed circle
4. An equilateral triangle on a given inscribed circle

4-9. When the length of the sides are not known, for which of the following geometric figures is it necessary to equally divide the circumference of the circle by trial and error with a compass?

1. A 5-sided irregular polygon inscribed in a given circle
2. A 5-sided regular polygon inscribed in a given circle
3. A 5-sided polygon inscribed on a given circle
4. Both 2 and 3 above

4-10. When two diameters of a circle are at right angles to each other, in which of the following geometric figures are all of the sides then drawn at 45° angles to the diameters?

1. A hexagon inscribed in a given circle
2. An octagon inscribed in a given circle
3. A pentagon inscribed in a given circle
4. A square inscribed in a given circle

4-11. In which of the following geometric figures are two of the sides drawn at 60° to the horizontal diameter of a given circle?

1. An equilateral triangle in a given circle
2. An equilateral triangle on a given circle
3. Both 1 and 2 above

4-12. Which of the following regular polygons may be constructed with only the length of one side given?

1. 5-sided polygon
2. 7-sided polygon
3. 9-sided polygon
4. All of the above

4-13. Assume that you have drawn a hexagonal bolt head from the given distance between its opposite corners. On the drawing, this distance is equal to the

1. diameter of the circle inscribed in the hexagon
2. diameter of the circle circumscribing the hexagon
3. diagonal of the square circumscribing the hexagon
4. side of the square circumscribing the hexagon

4-14. In the construction of a circle that is to pass through three given points, the center of the circle is determined by the intersection of what lines?

1. The perpendicular bisector of the longest line and the perpendicular line drawn from the end of the shortest line
2. The perpendicular bisector of the shortest line and the perpendicular line drawn from the end of the longest line
3. The perpendicular bisectors of the lines that connect the points
4. The tangents drawn through each point

4-15. To construct a line tangent to a circle at a given point on the circle, first set the compass

1. equal to the diameter of the circle
2. equal to the radius of the circle
3. to a distance less than the radius of the circle
4. to a distance greater than the radius and less than the diameter of the circle

4-16. To draw an arc of a given radius tangent to the sides of any angle, one of the essential steps of the procedure is to construct what two lines?

1. Two nonparallel lines at right angles to the sides of the angle
2. Two lines that are parallel to the sides of the angle at a distance equal to one half of the given radius
3. Two lines that are parallel to the sides of the angle at a distance equal to the given radius
4. Two parallel lines at right angles to the sides of the angle

4-17. In textbook figure 4-39, the radius O'P is equal to what distance?

1. Double the radius OP
2. The radius OP plus the radii of arcs CD and EF
3. The radius of arc CD plus AB
4. The radius of arc EF plus AB

4-18. In textbook figure 4-37, the compass spread O'P is equal to what distance?

1. AB
2. The radius OP minus AB
3. The radius of arc EF minus AB
4. The radius OP minus the radius of arc CD

4-19. In textbook figure 4-38, the radius OP is equal to what distance?

1. O'P
2. The line AB less the radius of arc CD
3. The line AB less the radius of arc EF
4. The sum of the radii of arcs CD and EF

4-20. What is the first step for constructing a compound curve, as shown in figure 4-40 of the textbook?

1. Draw the chords connecting AB, BC , CD, and DE
2. Erect a perpendicular bisector from A to B
3. Establish the random distance O_1A
4. Draw arc AB

4-21. Assume that you just constructed the ogee curve skown in figure 4-42 of the textbook. Which of the following points was NOT established by geometric construction?

1. C
2. D
3. E
4. O_1

4-22. When using the pin-and-string method to construct an ellipse, which of the following points should you use to determine the length of the string before drawing the perimeter of the ellipse?

1. Both end points of the minor axis and one focus point
2. Both end points of the major axis and one focus point
3. Both foci points and one end point of the minor axis
4. Both foci points and one end point of the major axis
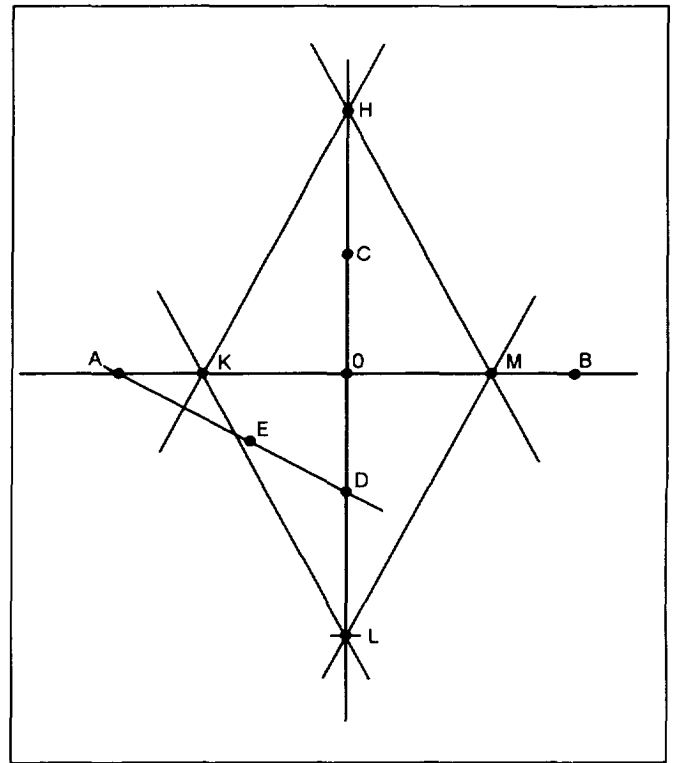
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Figure 4A

IN ANSWERING QUESTIONS 4-23 AND 4-24, REFER TO FIGURE 4A WHICH SHOWS THE CONSTRUCTION LINES USED FOR DRAWING AN ELLIPSE BY THE FOUR-CENTER METHOD.

4-23. Line DE is equivalent to which of the following lines or distances?

1. Line DO
2. Line KO
3. Line AO minus line AK
4. Line AO minus line DO

4-24. Which of the following descriptions describes point K correctly?

1. The end point of line KO, which is on the minor axis
2. The intersection of line AO with the perpendicular bisector of line AE
3. The intersection of line KO with the perpendicular bisector of line AD
4. The end point of line KO, which is equal to the difference in lengths of lines AO and DO

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4-25. In which of the following types of projection do the lines of sight converge?

1. Orthographic only
2. Perspective pictorial only
3. Both orthographic and perspective pictorial

4-26. In which of the following types of projection is the plane of projection between the point of sight and the object?

1. Orthographic only
2. Perspective pictorial only
3. Both orthographic and perspective pictorial

4-27. Which of the following types of projection involve only two-dimensional views of an object?

1. Orthographic only
2. Perspective pictorial only
3. Both orthographic and perspective pictorial

4-28. In which of the following types of projection is the point of sight located at infinity?

1. Orthographic only
2. Perspective pictorial only
3. Both orthographic and perspective pictorial

4-29. In an orthographic projection, which of the following views are the principal planes of projection?

1. Top, bottom, and side
2. Front, rear, and top
3. Front, bottom, and side
4. Front, top, and side

4-30. What is the most common orthographic projection used in the United States?

1. First-angle
2. Second-angle
3. Third-angle
4. Fourth-angle

4-31. Which of the following planes in the third-angle projection is considered to be in the plane of the drawing paper?

1. Horizontal
2. Vertical
3. Profile
4. Third-angle

4-32. How should views be spaced on tracing paper?

1. So they give the appearance of a balanced drawing
2. So they conserve as much paper as possible
3. In a manner that depicts a clear and concise picture of the object being drawn
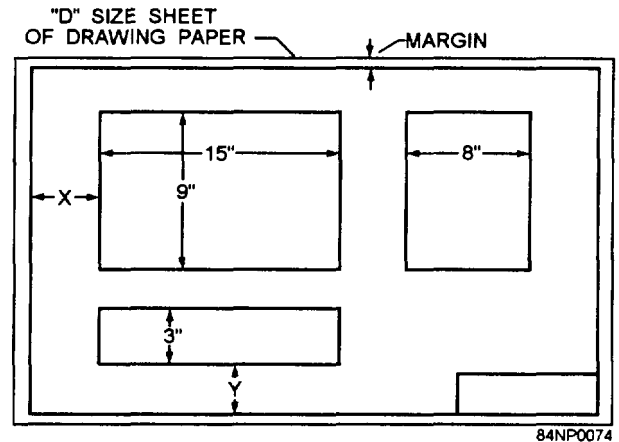4. In a manner that facilitates the projection of the views

Figure 4B

IN ANSWERING QUESTIONS 4-33 AND 4-34, REFER TO FIGURE 4B.

4-33. The distance X is equal to

1. 3 in
2. 3 1/3 in
3. 4 in
4. 4 1/3 in

4-34. The distance Y is equal to
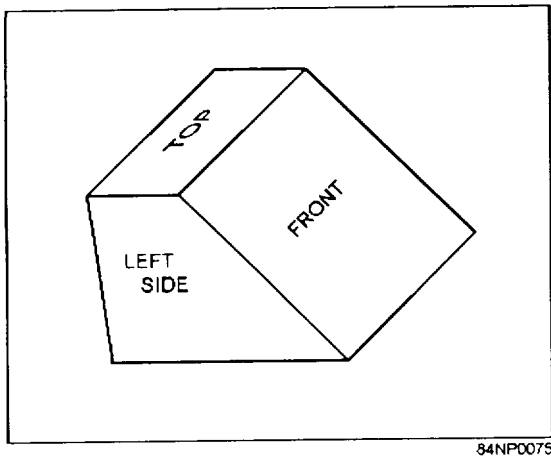
1. 2 in
2. 2 1/3 in
3. 3 in
4. 3 1/3 in

Figure 4C

IN ANSWERING QUESTION 4-35, REFER TO
FIGURE 4C.

4-35. Which of the following arrangements
is proper for the front-, top-, and
right-side views?

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4-36. Which of the following descriptions
applies to a non-normal line?

1. It is curved
2. It is perpendicular to a plane of
   projection
3. It is oblique to one or more of
   the planes of projection
4. It is always shown at its true
   length

4-37. In multi-view orthographic
projection, how should circles
appear?

1. As ellipses Only
2. As either circles or ellipses,
   depending on the view
3. In their true shape, but their
   size may be distorted
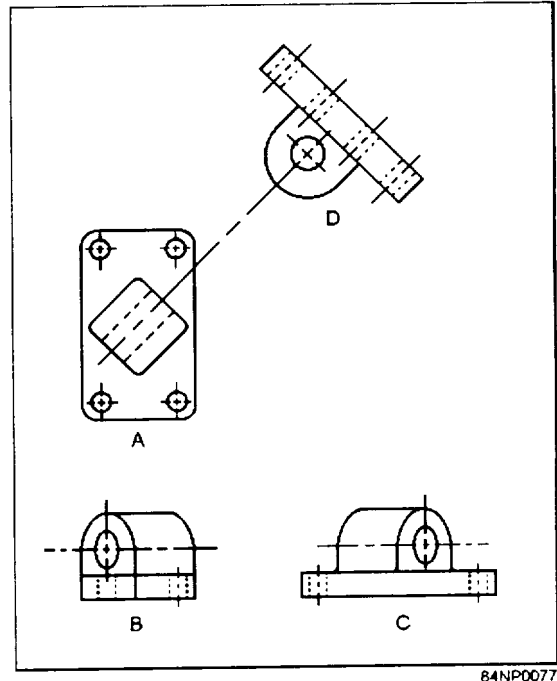4. Always in their true size and
   shape

Figure 4D

IN ANSWERING QUESTION 4-38, REFER TO
FIGURE 4D.

4-38. What drawing shows an auxiliary view
of the object?

1. A
2. B
3. C
4. D

4-39. An auxiliary view to a three-view
drawing is required if the object
has what characteristics?

1. More than four sides
2. No symmetrical sides
3. A detail that is on a plane
   parallel to a regular plane of
   projection
4. A surface where the true shape
   cannot be shown by a regular
   plane of projection

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A.   PROJECTED FROM THE FRONT VIEW
B.   PROJECTED FROM A SIDE VIEW
C.   PROJECTED FROM THE TOP VIEW
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4-40.   Front.

   1.   A
   2.   B
   3.   C

4-41.   Right side.

   1.   A
   2.   B
   3.   C

4-42.   Elevation.

   1.   A
   2.   B
   3.   c

4-43.   Left side.

   1.   A
   2.   B
   3.   C

4-44.   The rear auxiliary view could also have been projected from which of the following views?

   1.   Top
   2.   Front
   3.   Rear
   4.   Left side

4-45.   The line BD appears in its true length in the rear auxiliary view and in what other view, if any?

   1.   The right side
   2.   The top
   3.   The front
   4.   None

4-46.   What type of section view gives a complete cross-sectional view of an object?

   1.   Complete section
   2.   Full section
   3.   Full plane section
   4.   Plane section

4-47.   In half-sectioning a cylinder, how far should you extend the cutting plane?

   1.   Half the diameter of the cylinder
   2.   Half the radius of the cylinder
   3.   Half the circumference of the cylinder
   4.   A quarter of the circumference of the cylinder

4-48.   A section consisting of less than a half-section is referred to as what type of section?

   1.   Partial
   2.   Detail
   3.   Offset
   4.   Quarter

4-49.   At what angle from the horizontal should diagonal hatching be drawn in an orthographic projection?

   1.   15°
   2.   30°
   3.   45°
   4.   60°

4-50.   In an isometric drawing, what is the angle that each line of the axis forms with the adjacent line?

   1.   45°
   2.   60°
   3.   90°
   4.   120°

4-51.   In an isometric projection, the object is inclined to conform with which of the following characteristics?

   1.   All surfaces make the same angle with the plane of projection
   2.   The face makes an angle of 30° with the plane of projection
   3.   The face makes an angle of 60° with the plane of projection
   4.   Each edge forms an angle of 45° with the plane of projection

4-52.   Which of the following descriptions most accurately applies to the lines of projection in an isometric drawing?

   1.   Converging
   2.   Diverging
   3.   Parallel to the plane of projection
   4.   Perpendicular to the plane of projection

4-53. What method is used for drawing non-isometric lines whose ends do not fall on isometric lines or planes?

1. Corresponding end points
2. Conjugate axis
3. Orthographic
4. Section lining

4-54. When transferring an angle to an isometric view, which of the following guidelines should you use?

1. Represent the angle in its true size in the isometric view
2. Use the same method as when transferring a non-isometric line
3. Label the angle with its actual size as appearing on the isometric drawing
4. Reduce the size of the angle by one fifth

4-55. A figure appearing as a circle in regular multi-view view will take what shape in an isometric view?

1. Line
2. Circle
3. Oval
4. Ellipse

4-56. When an object is to be drawn in oblique projection, how should the front surface be positioned?

1. Perpendicular to the plane of projection
2. Parallel to the plane of projection
3. At an angle of 45° to the plane of projection
4. At an angle of either 30° or 60° to the plane of projection

IN ANSWERING QUESTIONS 4-57 THROUGH 4-60, SELECT THE OBLIQUE PROJECTION FROM THE FOLLOWING LIST THAT HAS THE CHARACTERISTICS LISTED.

A. CABINET ONLY
B. CAVALIER ONLY
C. CABINET AND CAVALIER

4-57. Front surface drawn in orthographic projection.

1. A
2. B
3. C

4-58. Oblique projection drawn to actual or dimensional length.

1. A
2. B
3. C

4-59. Oblique projection foreshortened by one half.

1. A
2. B
3. C

4-60. Single view showing length, width, and thickness of an object.

1. A
2. B
3. C

4-61. To save time, sketching to scale is commonly done with the aid of which of the following materials or implements?

1. Engineer's scale
2. Cross-section paper
3. Dividers
4. Draftsman's triangles

4-62. When freehand sketching, you should hold the pencil in what manner?

1. Between your middle and index fingers
2. With your index finger as close to the point as possible
3. Below your hand and between your thumb and fingers
4. With a relaxed grip about an inch from the point

4-63. When freehand sketching of an object, each line should be drawn in what manner?

1. With one complete stroke of the pencil
2. With the arm held in one position
3. With a series of short strokes of the pencil
4. With a wrist movement, rather than an arm movement

4-64. When sketching a long, straight vertical line, you should first place a dot at each end of the line. What is your next step?

1. Connect the dots with a series of short pencil strokes
2. Connect the dots with one long pencil stroke
3. Place additional dots at intermediate points along the line, then connect the dots with a series of short pencil strokes
4. Place additional dots at intermediate points along the line, then connect the dots with one long pencil stroke

4-65. To divide lines and areas into equal parts, you should use what process?

1. Visual approximation
2. Arbitrary estimation
3. Geometric construction
4. Dividing and redividing

4-66 What is the basic angle you should use when sketching?

1. 30°
2. 60°
3. 45°
4. 90°

4-67. Which of the following items will serve as a substitute for a pencil compass?

1. Pencil, piece of string, and a thumbtack
2. Pencil, rubberband, and a thumbtack
3. Two pencils and a rubberband
4. Two pencils and a piece of paper

4-68. One method of freehand sketching of a circle calls for you rotate the-paper with one hand. What part of your hand serves as the pivot point?

1. The side
2. Index finger only
3. Second finger only
4. Either the index or second finger, whichever is easier
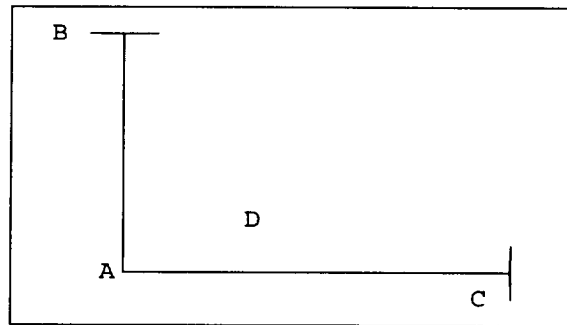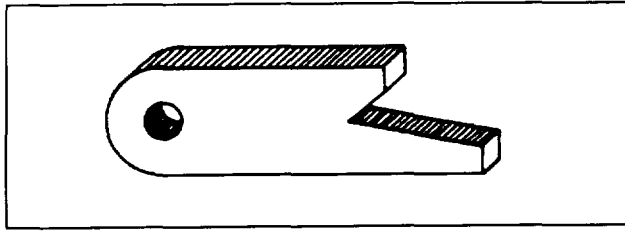

Figure 4E

IN ANSWERING QUESTIONS 4-69 AND 4-70, YOU ARE DFUIWING A CURVE TANGENT TO STRAIGHT LINES AND HAVE PROCEEDED AS FAR AS SHOWN IN FIGURE 4E.

4-69. What should your next step be?

1. Placing a dot at D
2. Sketching a light curve through D between B and C
3. Drawing a straight line between B and C
4. Drawing a straight line from A through D midway between B and C

4-70. What is the preferred way to sketch the curve after you place the dot or X through which the curve is to pass?

1. Start at B, and proceed through the dot or X, and end at C
2. Start at C, proceed through the dot or X, and end at D
3. Start at the dot or X and sketch to C, return to the dot or X, and then sketch to B
4. Start at D, proceed to C, back to D, and then to B

Figure 4F

IN ANSWERING QUESTION 4-71, REFER TO FIGURE 4F.

4-71. If you are sketching the object shown, what step should you take first?

1. Draw a circle
2. Draw a rectangular block
3. Draw light guidelines to represent the outlines of the object
4. Draw the details

4-72. Pictorial sketches differ from orthographic sketches in which of the following ways?

1. Pictorial sketches are normally drawn to scale while orthographic sketches are not
2. Pictorial sketches deal with volumes, rather than planes
3. Pictorial sketches are usually less detailed than orthographic sketches
4. Pictorial sketches require the use of mechanical aids in their preparation

4-73. What is the primary use of overlay sketches?

1. Preliminary design
2. Changes in design
3. Planning purposes
4. Supplementing previously drawn sketches